FOREST MANAGEMENT PLAN
City of Scappoose

Jay Worley
Forester
November 2001

FOREWARD

It is my intent that this plan will be utilized by the City of Scappoose as a tool to assist in management and decision making regarding the forested City properties. This Plan will accurately describe the present condition of the resource, will present an array of options for management, and the subsequent likely outcomes.

GOALS and PRIORITIES

The maintenance and protection of high quality water for the City of Scappoose has been identified as the number one goal for the management of our forested acres. Timber harvesting activities are subordinate to this goal. Protection of fish and wildlife is also recognized as an important goal that should be considered in all management decisions.

Testimony of Dave Powers (503-397-5473)
34017 Slavens Road, Warren, OR 97053

Jan 7, 2002

* The City of Scappoose and Jay Worley, the Forester preparing the Forest Management Plan for the City's lands, should be commended for a thoughtful, well developed plan that acknowledges the importance of high quality drinking water, fish and wildlife resources, and sustainable timber management. It helps keep the City's future options open.

* The identification of Forest Type Islands with attendant unit-tailored management is forward thinking and a sound approach for managing city owned lands.

* The plan includes sound recommendations regarding old growth and riparian protection and down wood/slash management. Road and dry weather logging recommendations are on target. Additionally, the structure-based management recommendations will serve the City well both now and in the future.

* Potential concerns about lost revenue for the City can be viewed in a number of ways. Leaving trees now doesn't preclude cutting them in the future when log values may be substantially higher...the trees will keep growing and will provide water quality and fish and wildlife values until they are cut...although once cut, there is diminished water quality and fish/wildlife value for a decade or several decades and limited or no timber options for 40 to 60 years.

* Current Oregon Forest Practices do not fully protect water quality:
- 1999 IMST Report found that Oregon's Forest Practices Act (FPA) would not recover salmon and trout
- ODF and DEQ did a FPA sufficiency analysis in 2000 which found that the FPA even with BMPs implemented would impair water quality on small and medium streams
- FPA Committee 2000 recommendations for increased riparian and landslide protection
- FWS, NMFS, and EPA found that FPA rules are the least protective rules in Oregon and provide 1/2 to 1/3 of the protection as Washington's rule in similar forest types

* Maintaining high quality municipal water supplies is critical:
- Some towns and cities do not allow any timber harvest within their municipal watersheds because of the importance of high quality drinking water
- Communities like St. Helens frequently go to bottled water during storm events
- Scappoose gets approximately 1/3 of it's water from surface water which is higher quality than available well water so the two sources are mixed. to improve quality
- Scappoose has to shut down surface water intake during some storm events which could potentially be avoided if more City and adjacent private forest lands are left forested

Additional considerations for inclusion into the Forest Management Plan:

1) Eliminate Herbicide use and utilize manual brush control:
- Better meets WQ and Fish and Wildlife goals
- Provides employment for Columbia County residents

- Reduces risks to and complaints from Scappoose residents
- Provides opportunities for at-risk-youth keeping Lower Columbia River Youth Corps in work and/or provides local employment for local workers
- Reduces legal risk to the city...current lawsuit against EPA for inadequate label requirements and NMFS challenging herbicide use based on fish effects
- Reduced drinking water monitoring costs...timber companies using herbicides on private lands would need to pay monitoring costs
- Possible funding to help offset manual control costs (SBWC, County Pymts.)

2) Increase tree retention beyond 2 green trees/acre in regeneration patch cuts, especially in landslide prone areas and at springs, seeps, and stream initiation points and confluences:

- Landslide prone areas are a major source of sediment
- Regeneration harvest can significantly increase landslide potential and sedimentation... ODF landslide studies show a 200 - 500% increase in shallow landslides on 3 out of 4 sites studied for a decade or more after clearcutting
- Many tribal, federal, and municipal plans recognize the importance of protecting landslide prone areas and prohibit timber harvest on those areas
- Springs, seeps, and stream initiation points/confluences are valuable for fish and wildlife and are protected under WA State Forest Practices and most Tribal and Federal plans

-The City of Scappoose, County, and the Scappoose Bay Watershed Council are spending about half a million dollars to provide fish passage up Scappoose Creek and into the Gourlay Creek drainage to allow salmon and trout to utilize forested areas

3) Pursue authorization of forest product certification. This can significantly increase the dollar value/volume harvested. Some companies such as Lowes and Home Depot sell certified forest products. This may require some additional plan components

4) Enter into discussions with adjacent land owners/managers to consider protection of municipal water supply as a key component of timber harvest plans. There is county, state, federal, and private foundation funding available to compensate landowners for increased conservation efforts.

CITY OF SCAPPOOSE

Request for Council Action

Date Submitted:	January 3, 2002
Agenda Date Requested:	January 7, 2002
To:	Scappoose City Council
Through:	Jon Hanken, Community Development Director
From:	Michael D. Walter, Planning Services Manager
Subject:	Updated Forest Management Plan

TYPE OF ACTION REQUESTED:

[X]	**Resolution**	[ ]	**Ordinance**
[ ]	**Formal Action/Motion**	[ ]	**Contract Review Board**
[ ]	**None - Report Only**		

ISSUE:

On July 17, 2001, the Scappoose Urban Forestry Advisory Board (UFAB) officially recommended that the City Council approve a Scope of Services Contract by Jay P. Worley, City Forester, in order to draft a new Forest Management Plan for forested lands owned and operated by the City of Scappoose. The UFAB, as well as staff, noted that the existing Forest Management Plan is outdated, and would benefit from modernization in regard to forest management policies and recommendations. Subsequently, the City Council approved the contract.

On November 20, 2001 the UFAB reviewed the completed draft version of the new Forest Management Plan, making a few recommendations regarding minor edits. The UFAB voted to recommend that the City Council consider the proposed Forest Management Plan (see the suggested Resolution, below).

Approved by City Council on Jan 7, 2002

OPTIONS:

1. Adopt the proposed Resolution, thereby adopting an updated Forest Management Plan (2001), which will supersede the existing Forest Management Plan (1990).

2. Do not adopt the proposed Resolution.

RECOMMENDATION: It is staff's recommendation that the City Council approve the adoption of the updated Forest Management Plan (2001).

SUGGESTED MOTION: I move that the City Council approve the proposed Resolution as presented.

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SCAPPOOSE APPROVING THE SCAPPOOSE FOREST MANAGEMENT PLAN

WHEREAS, City Forester Jay P. Worley has prepared a Forest Management Plan dated November 2001 the purpose of which is to provide maintenance and protection of high quality water and fish and wildlife habitat protection for the City of Scappoose through the management of City owned forested acres; and

WHEREAS, before the plan can be implemented it is required that it be approved by the City Council; and

WHEREAS, the Urban Forestry Advisory Board has reviewed the Forest Management Plan in a public meeting and recommended approval of the Forest Management Plan to the City Council;

NOW, THEREFORE BE IT RESOLVED, that the City Of Scappoose hereby adopts the Scappoose Forest Management (2001), which supersedes all sections of the Scappoose Forest Management Plan (1990).

IN WITNESS WHEREOF, I hereunto set my hand and cause the seal of the City of Scappoose, to be affixed. Done at City Hall in the City of Scappoose, Oregon, on this __ day of ____ 2002.

CITY OF SCAPPOOSE, OREGON

_____
Glenn E. Dorschler, Mayor

Attest: _____
Debi G. Schmit, City Recorder

FOREST TYPE ISLANDS

For purpose of discussion and identification, a tract of forest land is generally referred to as a like vegetated " type island ". These " type islands " can then be systematically examined, and described as follows:

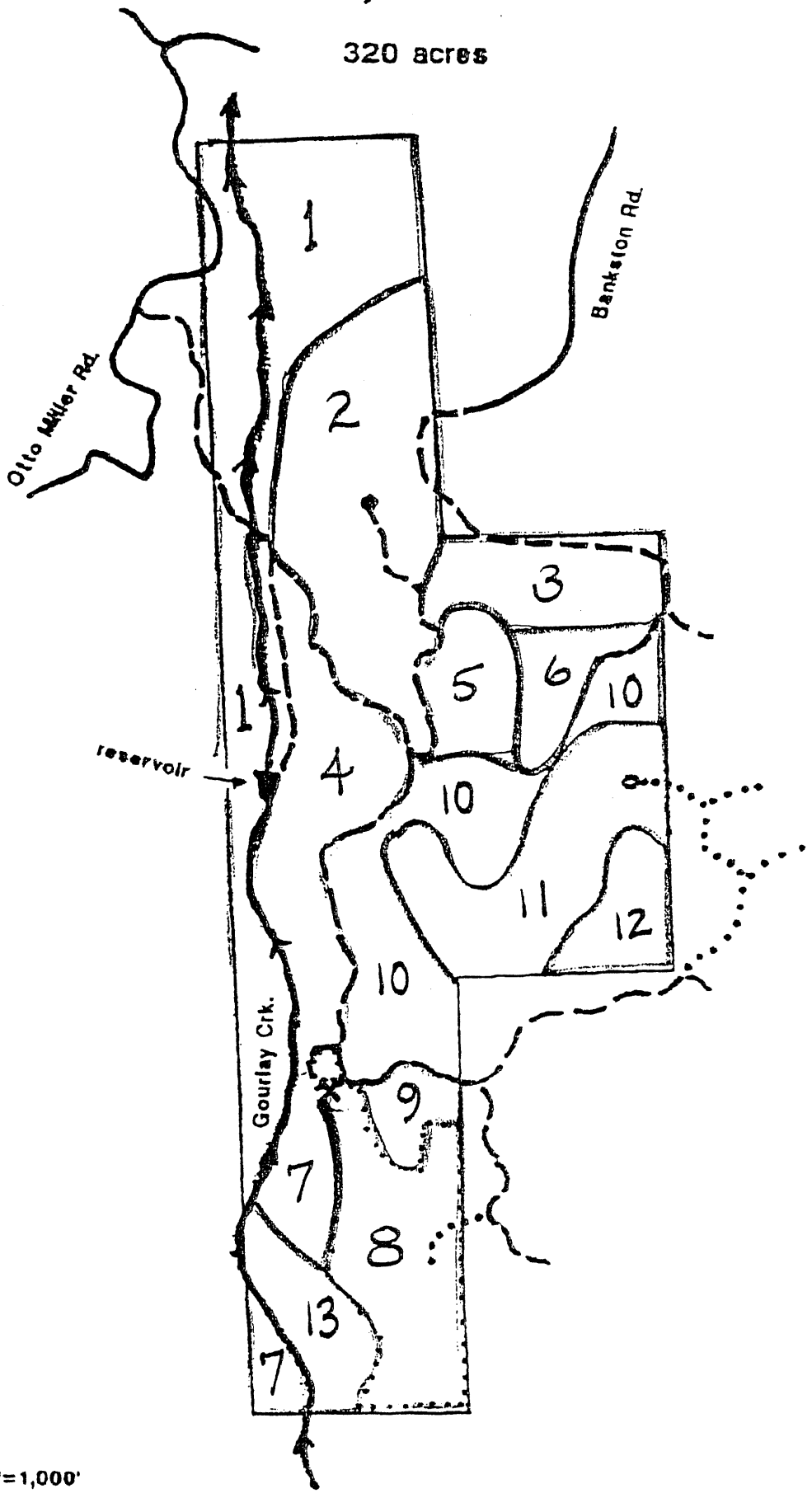
TYPE 1	Approx 75 Acres	This forest type dominates the North and West portions of the tract. It is composed of primarily alder and maple that occupied the site after old growth logging. There are scattered small islands of mature Douglas fir, Cedar, and Hemlock up to three feet in diameter and 100 years of age. This area has a heavy brush understory. Very few young trees present in the understory. Some small and site specific areas may be harvested without adverse effects on water resources. The vast majority of this timber type is below the City dam.
TYPE 2	Approx 50 Acres	This unit was clear cut logged in 1990. The unit was planted in 1991 with 400 Douglas fir seedlings per acre. The competing brush species have been slashed and chemically treated twice by hand crews to ensure reforestation success. No further treatment is needed. This unit could be ready for commercial thinning in 20 years.
TYPE 3	Approx 15 Acres	This unit was clear cut logged and planted in 1985. There are approximately 250 dominant, 8 inch diameter (DBH) Douglas firs per acre. No further treatment is needed. This unit may be ready for commercial thinning in 10 years.
TYPE 4	Approx 30 Acres	This unit comprises much of the East half of the riparian area to Gourlay Creek. The vast majority of this area is dominated by 45 year old Alder and Maple with inclusions of conifer timber. There are no understory trees emerging as replacements for the existing stand. The Salmonberry competition in this area is severe.

TYPE 5	Approx 9 Acres	This unit is a fully stocked 58 year old Douglas fir stand. This stand was commercially thinned by contract with Friesen Lumber in 1991-1992. The unit has been marked to thin again in the summer of 2002.
TYPE 6	Approx 7 Acres	This unit was clear cut logged and planted in 1982. The unit has 250 dominant trees per acre in the 9 to 10 inch DBH range. The stand is 85% Douglas fir and 15% Alder. This could be commercially thinned along with TYPE 3.
TYPE 7	Approx 18 Acres	This 40 year old fully stocked Red Alder stand occupies much of the riparian area in the South end of the tract.
TYPE 8	Approx 30 Acres	This unit was clear cut in 1999. It was planted in 2000. Additional seedlings were interplanted in 2001 to bring the total to 15,000. A s tocking survey will be done to assess survival in the winter of 2002. Planted 80% Douglas fir, 20% Hemlock, Cedar, and Grand fir to imitate original stand structure. Sprouted Bigleaf Maple stumps should be hand treated with Garlon 4 the Fall of 2002. See attached chemical information.
TYPE 9	Approx 4 Acres	This unit is composed of 55 year old Douglas fir in an overstocked condition, marked for commercial thinning in 2002. This unit has a number of residual old growth trees which are reserved from cutting.
TYPE 10	Approx 40 Acres	This unit is the most variable in terms of tree species (conifer & deciduous) and age (scattered Douglas fir 200 yrs +).Terrain is also highly variable, from gentle to steep (gentle to 70%+) . Management of this area will encourage and build upon existing diversity in stand structure.
TYPE 11	Approx 23 Acres	This is a well stocked 55 year old stand of Douglas fir marked for commercial thinning Summer 2002.

TYPE 12	Approx 10 Acres	This unit was clear cut in 1993. The area was planted in 1994, and interplanted in 1997. The unit has had the competing species slashed by hand crews twice. This needs to be done once more in the Fall 2002 to ensure reforestation success.
TYPE 13	Approx 9 acres	Adequately stocked 30 year old conifer timber adjacent to Gourlay Creek . Most valuable to be retained as a buffer and as future conifer LWD.
TYPE 14	Approx 12 acres	Medium stocked 16 year old Douglas fir.
TYPE 15	Approx 30 acres	Medium stocked 60 to 75 year old mixed conifer timber
TYPE 16	Approx 46 acres	Poorly stocked alder, maple, and brush
TYPE 17	Approx 4 Acres	Powerline

Gourlay Creek Tract

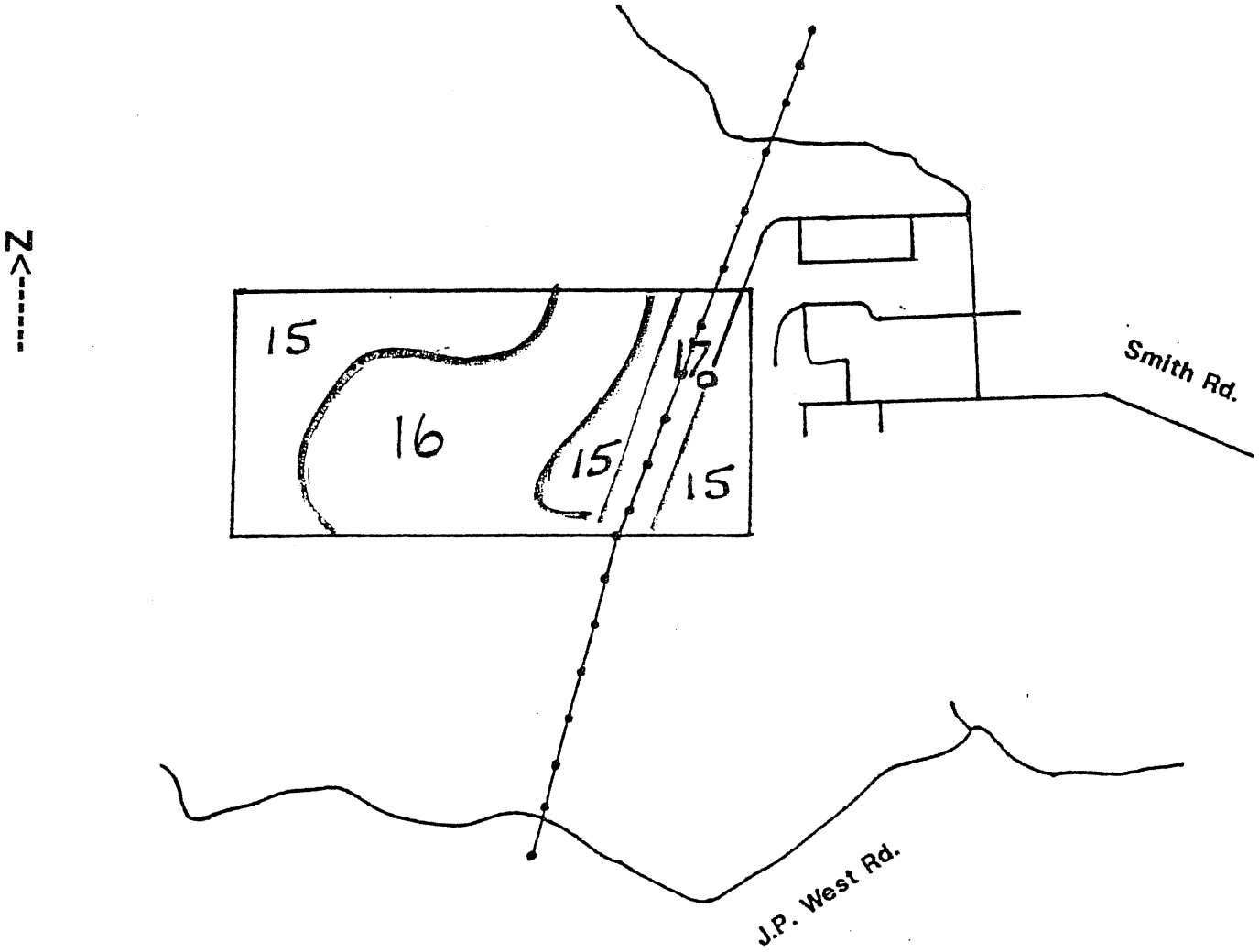
320 acres



Scale: 1"=1,000'

Water Tower Tract

80 acres



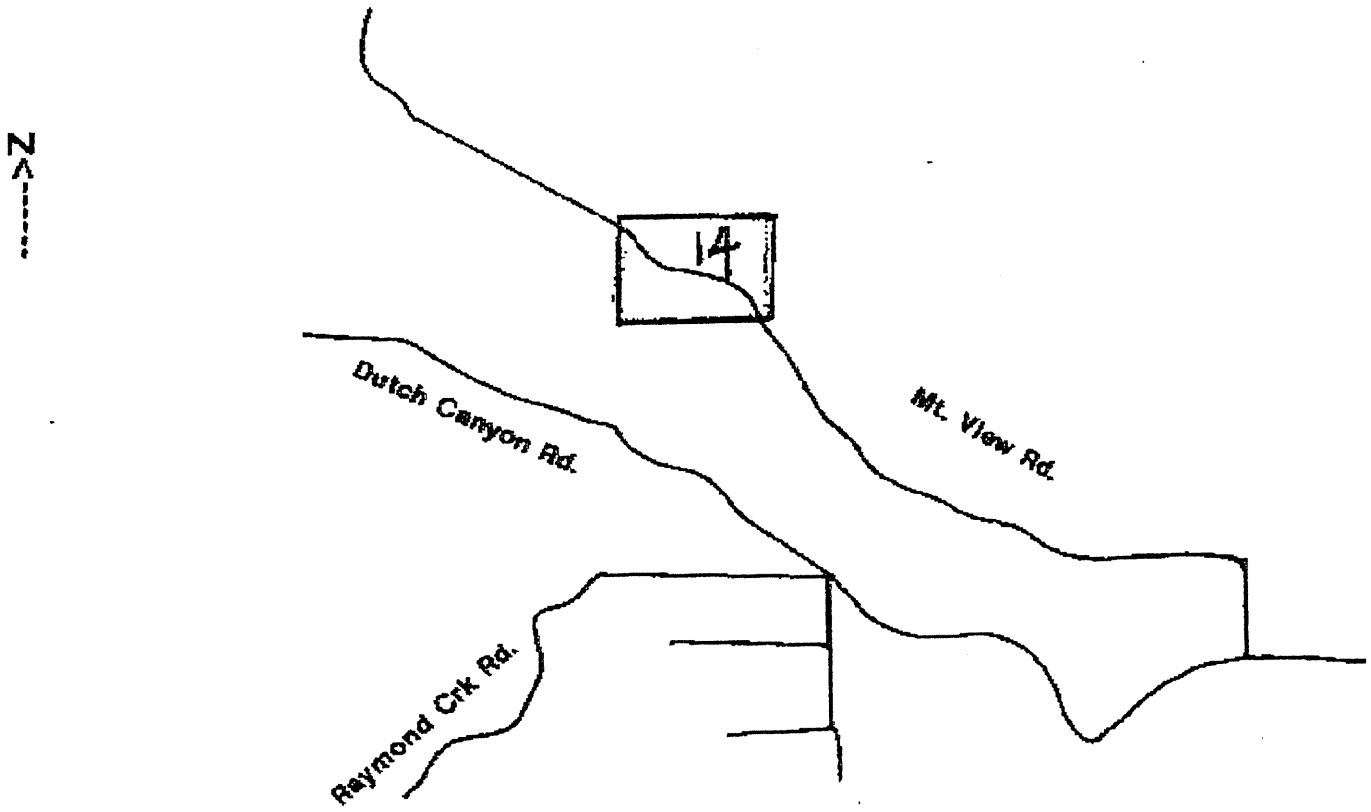
BPA powerline

water tower

Scale: 1"=1,000'

Mt. View Tract

12 acres



HERBICIDE USE

Herbicides are used in the forest to eliminate unwanted brush species that compete with planted seedlings for light, nutrients, and moisture. These herbicides can be applied by helicopter, or by hand by means of a backpack sprayer, or squirt bottle.
Herbicides commonly utilized are TRICLOPYR, and GLYPHOSATE.
(see OSU extension fact sheets in appendix) TRICLOPYR in the form of Garlon 4 has been used twice in fighting brush in TYPE 2. It was applied by hand as a cut surface treatment to Bigleaf Maple sprouted stumps to prevent re-sprouting.

Each planted unit must be monitored for progress, and the development of competition.
The tactics employed to ensure successful reforestation will vary greatly from unit to unit.
There is no set "cook book" method. Tactics used depend on the following factors:

1. Brush species present...some are problems, some are not;
2. Seedling species planted...some species need more sun than others;
3. Proximity to water;
4. Public perception;
5. Wildlife considerations; and,
6. Cost of brush control

One must consider all these factors in relation to the desired goal for the forest.
Maximizing timber growth at a cheap ($50 per acre) cost implies aerial spraying.
A complete chemical ban will imply expensive ($300 per acre) hand cutting of brush, and a low (70%) survival rate on the seedlings. Unit 2 planted in 1991 was not aerially sprayed. It has been slashed by hand, and the Bigleaf Maple treated with TRICLOPYR twice at a cost to the City of $220 per acre. It is now 85% of full stocking.... good, but not maximizing timber growth. This unit exhibits a middle of the road compromise.
Is not impossible to grow conifers without chemicals, just tougher and more expensive, with significantly less merchantable timber in the end.

DOMESTIC WATER PROTECTION

As stated, the preservation of water quality and quantity is the number one consideration of this forest management plan. Although existing STATE law governing forest practices is adequate to this end, I feel a policy of exceeding these minimum requirements is necessary to ensure an optimum situation. Each planned activity on CITY forestland must be examined as to any potential damage to the watershed. The benefit of such activity must greatly outweigh the risk. Unfortunately, the activities that provide the most monetary benefit (such as timber harvesting) can potentially be the most destructive. Some activities (such as brush cutting without chemical) have no risk to the watershed, but increase cost to the CITY in the form of repeated treatments to achieve successful reforestation. It is my contention that each planned practice and site be carefully analyzed, and then acted upon. It must also be recognized that despite our best efforts to predict the outcome of an activity in the woods, we will sometimes be fooled. Mother Nature can be very unpredictable.

Following is a list of items I suggest we employ:

1. No aerial spraying of herbicides
2. Hand applied herbicides be allowed on a case by case basis
3. No timber harvesting activity within 300 feet (slope distance) of Gourlay Creek
4. No timber harvesting within 100 feet of any perennial stream
5. Future timber harvest based on " Structure Based Management" principals and guidelines
6. No Winter, or wet weather, logging

OLD GROWTH TREES

There are a number of old growth trees scattered on the Gourlay Creek tract. Several are along the West boundary that are six feet in diameter, and probably 450 years old. There are smaller specimens in the timber around the "switchbacks" in the road, and a number scattered in the central portion of the tract. These trees range in diameter from three to four feet. I estimate their age to be about 250 to 300 years old. Even though these areas have been logged at least twice, these trees remain. Why? Probably because they are not very sound trees now, and they didn't look much better to the loggers of the 1920's and 1950's. These trees are much more valuable to us as wildlife habitat, and as a legacy, than they ever could be as lumber. I suggest we never cut them. These trees are easily identified in the field, and all timber-harvesting operations in their vicinity must provide for their protection.

SNAGS

The retention, and creation of snags is critical to many species of bird, and cavity inhabiting mammals. I have witnessed both the Pilated Woodpecker and the Red Tailed Hawk utilizing snags on the tract.

Snags on the tract should all be maintained, unless safety regulations require that the snag be felled. To demanding otherwise would put the CITY in serious jeopardy. In final harvest logging unit we should strive to save, or create four snags per acre. This would be in addition to two live trees per acre left. At least one of these should be larger (24 inches diameter plus) in size. Live trees can be topped and limbed as part of a timber harvesting operation, should the number of natural snags be inadequate. It must be pointed out that creating a 24 inch snag will cost the City about $500 per snag in lost timber revenue and labor costs.

DOWN WOOD MANAGEMENT

Maintaining adequate amounts of woody debris on the forest floor is important in adding organic material to the soil, preventing soil erosion, and keeping the moisture carrying capacity high. These logs, fallen trees, chunks, tops, and limbs also provide habitat for amphibians, insects, and small mammals. They are also home to a wide variety of beneficial fungi found in forest soils.

I suggest the following:

1. All old growth downed material should be left in place. Cull second growth wind falls should be left in place. Sound second growth wind falls can be harvested.
2. Logging slash in thinning operations should be left in place, and not piled.
3. Logging slash from a regeneration harvest should be left in place, unless adequate reforestation (i.e. tree planting) cannot be accomplished without piling the slash.

I do not envision the need to "create" downed logs. With the older stand structure as a goal for the remaining conifer timbered sites, and a snag retention policy, there will be plenty of large downed woody debris.

REFORESTATION

The reforestation of a timber harvest is a very site specific undertaking. Existing tree species, future economic goals & expectations, wildlife habitat considerations, brush species, existing natural seeding, big game browse, soil conditions, and the proximity to streams and drainages all must be considered in planting a unit. If growing and harvesting Douglas fir timber was our only goal this would be relatively easy. You clear cut the unit, pile and spray the unit, plant 400 Douglas firs per acre, and aerial spray the unit twice more to keep the brush down. As our goals are numerous for the watershed, and not only revenue, I suggest the following guidelines be considered :

1. Base reforestation decisions on the conditions of that specific unit at hand.
2. Utilize a species mix of conifer seedlings in planting. Douglas fir, Western Red Cedar, Western Hemlock, and Grand fir are present and growing well on the tract.
3. Utilize chemicals with hand applications only. Utilize chemicals as an tool to attain reforestation success, and not optimum timber production.
4. Plant a large number of seedlings per acre (500) to handle heavy deer and elk browse, and limited brush control tactics.

THE CONCEPT

You can't optimize merchantable timber growth and harvest, and provide optimal conditions for water and wildlife at the same time. This I believe to be true. I do feel , however, we can have a very active timber management program and not have any significant , or measurable, effects on our water or wildlife on CITY forest lands.

At present the 320 acre Gourlay Creek Tract acreage falls into four broad categories:

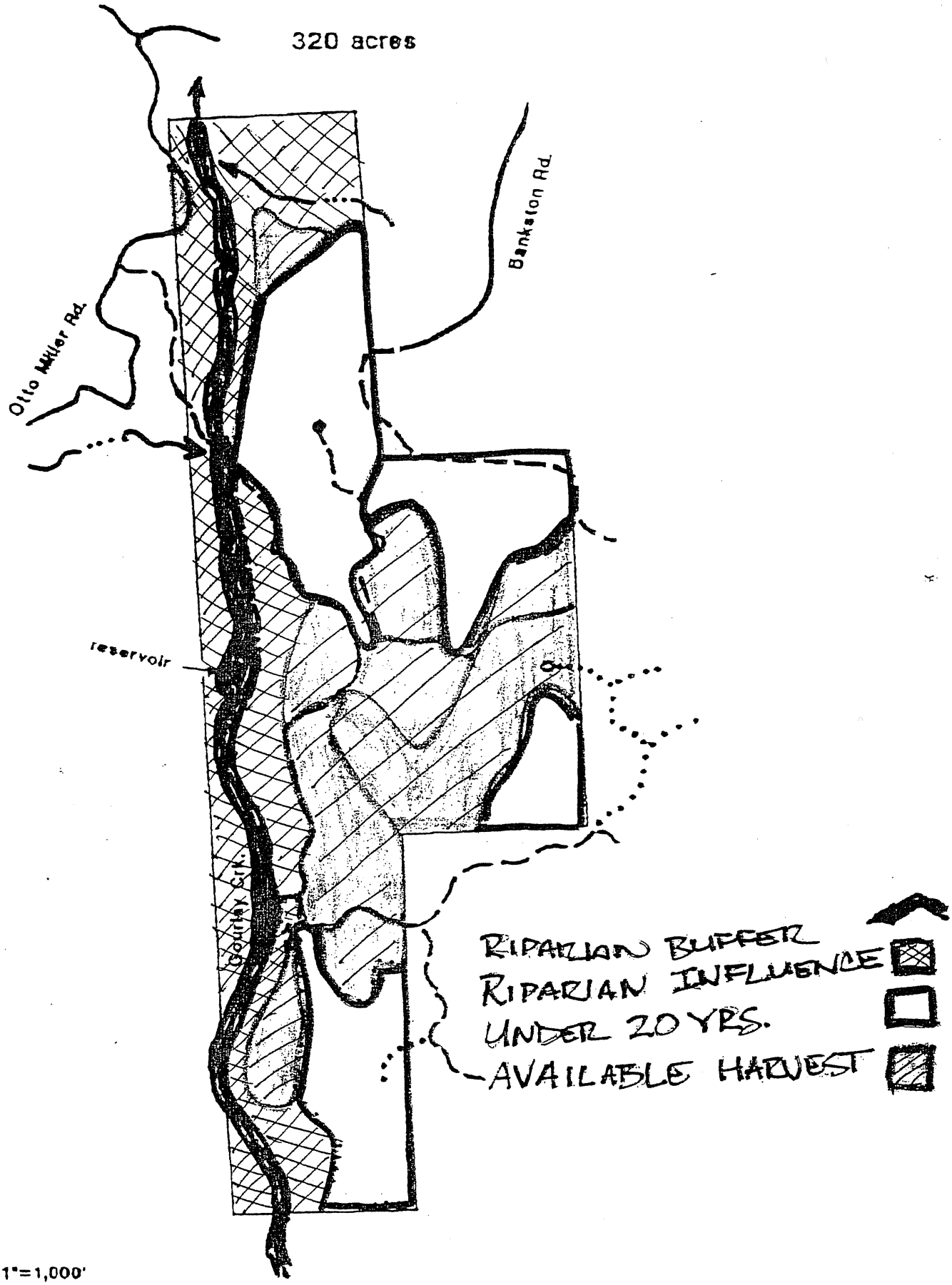
Riparian no activity by current law	40	Acres	13%
Riparian influence timber	63	Acres	20%
Conifer under 20 years old	112	Acres	35%
Upland timber	105	Acres	32%

I define the "Riparian no activity under current law" as the 100 foot slope distance either side of Gourlay Creek. This zone is likely to expand under law in the near future. Riparian influence timber I define as timber harvestable under law, but carries a possibility of measurable negative effects on water quality and riparian microclimatic conditions. Conifer under 20 years of age are the planted clear cuts harvested from1982 to 1999. Upland timber are those areas that can sustain timber harvesting operations over time without any negative measurable effects on water and wildlife likely.
It is from this platform that we have the opportunity to go forward and make informed, intelligent descions. I feel this platform is in good shape. We have roughly one third dedicated to riparian preservation, one third in young conifers with timber growing as a high priority, and one third of mixed species second growth timber. It is this last third that will take the greatest amount of thought.

Ideas about forest management have changed rapidly in the last decade. One can have a viable working forest and harvest timber, without degrading water and wildlife. But how? VARIATION & DIVERSITY. We need diversity of structure and species both within treated units, across the entire landscape of the tract.I would like to see the remaining acres of actively managed timber harvested as partial cuts, or small patch cuts depending upon the specific needs and objectives of that stand. It must be realized that the existing physical conditions of a stand, terrain, and species composition may limit options for management.

Gourlay Creek Tract

320 acres



Scale: 1"=1,000'

We have basically three types of second growth forest on City properties in question:

1. Vast majority Douglas fir with few other species
2. Vast majority Red Alder& Maple with a few scattered large conifers
3. Mixed alder, maple, fir, and cedar

My vision for the future of these stands is based largely on the concepts of Structure Based Management (as described in the attached) and the Variable Retention management strategy used by Weyerhaeuser and MacMillian Bloedel. My vision for these stands can be termed Succession Acceleration. Harvesting timber would not be excluded, but used as a tool to mimic the natural succession stages of forest development, and compress the length of time it takes to create older forest conditions into 100 years instead of 500 years. How is this done ?

The " vast majority " Douglas fir stands (like the present thinning sale) are thinned several times from about age 30 to 70. These thinnings provide a modest economic return, and stimulates growth on residual trees. The continued thinning over time of these stands would allow enough light to the forest floor to support a planted mixed species understory. This will look like a very wide spaced thinning at this stage, with trees about 40 feet apart (similar to old growth stocking levels). When the planted trees reach about 30 years of age you thin them and decide to take or leave some of the 100 year old leave trees.

Options for the " vast majority" red alder and maple stands are very limited. These species respond to thinning very poorly. Thin bark of alders gets scarred and ends up in decay. More sunlight results in huge spreading crowns that won't allow anything else to grow up with them. Alders only live about 75 years and then die. These areas are likely candidates for "regeneration harvest " which are essentially small, ragged clear cuts which remove the alder, much of the maple, but leave behind much of the scattered fir and cedar, incorporating the aforementioned concepts of snags, down wood, and residual trees. These units would be planted to 70% Douglas fir and the remainder cedar, grand fir, and hemlock.

The truly mixed stands present the greatest opportunity to create diverse stands with mature forest characteristics. These stands could be managed with interspersed patch cuts (i.e. small 5 to 10 acre regeneration harvests) and partial cuts (i.e. thinning) depending upon microsite characteristics, and silvicultural need. The patch cuts would be laid out in a loggable manner, yet incorporating due consideration to snags, old growth & wildlife trees, down wood , mixed species planting , and irregular boundaries. The patches of heavily stocked Douglas fir could be periodically thinned as outlined above. The leave trees in this area will form the overstory to a planted understory. The patch cuts could be reforested with primarily Douglas fir. The thinned patches would be eventually planted with a mixture of conifer species depending on overstory density.

The advantages to this type of approach over traditional forestry are:

1. Greater protection for the riparian area than under existing law
2. Probably better for fish production than under existing law
3. Better for other wildlife species
4. Greater tree species diversity that mimics natural stands
5. Maintains soil organic materials and productivity to a greater extent
6. No large clear cut areas on landscape
7. Minimal herbicide use....none by air
8. Probably less sedimentation in streams
9. Probably less chance of mass soil movement
10. Aesthetically more pleasing

The disadvantages as compared to traditional forestry are:

1. Major loss in timber growth and value. The Gourlay Creek Tract will produce about 50% less in timber revenue, due to higher logging cost & lower value species grown.
2. Reforestation costs are higher, both planting and brush control
3. Professional Forester costs are higher, operations are more complicated and take more hours to lay out and supervise

ROAD CONSTRUCTION

Road construction and earth movement of any kind should be kept to a minimum. Excessive permanent road construction contributes to stream sedimentation, and takes valuable land away from growing trees. Fortunately the main permanent road system needed to manage the tract is in place. This combined with dry weather logging only may eliminate the need for any future permanent rocked roads being built.
I feel the future logging can be done utilizing dirt spur roads branching off the existing road system. These roads can be waterbarred, and grass & legume seeded. They can be also blocked off and planted with trees, such as the case of the 1999 clear cut.

Potential road building damage and cost must be carefully weighed against potential benefit when contemplating access to timber. Some of the "tough to get to" areas of the tract may become sites that are never logged and become part of the diverse structure of the landscape.

There is a rock pit on the tract (see map). I do not know the last time any rock was taken from the site. Unfortunately this rock pit is located about 250 feet slope distance above Gourlay Creek. This is also upstream from the City dam location. I have seen no evidence of slope instability or movement towards the creek. The fact that that the pit did not slide

into the creek during the intense winters of 1995 and 1996 is encouraging. Perhaps a geologist should be hired to check it out and suggest any rehabilitation work that may need to be done. I would suggest that no more rock be taken from the pit without such a professional examination and report.

TIMBER VOLUMES & VALUES

AVAILABLE FOR HARVEST GOURLAY CREEK

	VOLUME	NET VALUE
DOUGLAS FIR	1,800 MBF	$630,000
RED ALDER	750 MBF	$187,500
CEDAR	280 MBF	$182,000
MAPLE	320 MBF	$8,000
HEMLOCK	150 MBF	$27,000
	3,300 MBF	$1,034,500

PRUDENT AVAILABLE HARVEST GOURLAY CREEK

	VOLUME	NET VALUE
DOUGLAS FIR	1,380 MBF	$483,000
RED ALDER	240 MBF	$60,000
CEDAR	190 MBF	$123,500
MAPLE	160 MBF	$4,000
HEMLOCK	100 MBF	$18,000
	2,070 MBF	$688,000

The sustainable yield on the "prudent" harvest on the Gourlay tract is about 80 MBF per year at a annual timber growth rate of 4% simple interest.

WATERTOWER TRACT

	VOLUME		NET VALUE
DOUGLAS FIR	1,110	MBF	$388,500
RED ALDER	100	MBF	$25,000
CEDAR	50	MBF	$32,500
MAPLE	50	MBF	$1,250
HEMLOCK	8	MBF	$1,440
	1,318	MBF	$448,690

This tract may have potential to be developed into a park, hiking trail, or wildlife viewing area. This timber lies within the City limits and is not part of the timber harvesting plans.

MOUNTAIN VIEW TRACT

The greatest value of this tract to the City may be in selling it as residential property . Future logging and management of this parcel will likely be impacted by the surrounding residential development. I suggest that this parcel be appraised and planned for along these lines

SOILS

In discussing forest soils generally the following components are considered ; erosion hazard, equipment limitations, seedling mortality, windthrow hazard, tree species to plant, and site index. The mapping of these soils , and their characteristics, are generalized. Specific site conditions, of course, should always be examined and due consideration given.

The Gourlay Creek tract is made up of Goble Silt Loam, Melby Silt Loam, Scaponia-Braun Silt Loam, and Bacona Silt Loam, as designated on the soils map. These are all well, to moderately well, drained soils that according to the USDA Soil Survey are best suited for water, wildlife, recreation, and timber production.The vast majority of the Gourlay Creek tract is rated as highly erosive, with a moderate rating for logging equipment limitations. This means special measures and considerations must be given to any activity that can trigger soil movement and sedimentation problems. These soils rate at a moderate for planted seedling mortality, and windthrow potential for mature timber. I was a little disappointed to find that the upland third of the tract has a very modest site index of 143..... below average for this vicinity. In contrast, however, the Western two thirds of the tract has an average site index of 165.... above average for the general vicinity.

The Water Tower tract is characterized by mioderate to steep soils throughout. Two major draws consist of the soil series Xerochrepts. It is a deep well drained soil , that is subject to erosion and should not be cat logged.

The ridge tops of this tract are Cascade Silt Loams. These are moderartely deep, but poorly drained soils. They form a winter time perched water table that can keep trees in a shallow rooted condition that makes them suseptable to windthrow. These soils are easily compacted when wet. These soilas aare average in timber growing with a site index of 153.

The mid slope areas are Scaponia Braun silt loams. These highly productive soils, site index 163, are highly susceptable to water induced soil erosion. No cat logging on these slopes recommended.

The 12 acre Mountain View Tract is composed of Cascade Silt Loam identical to the ridgetop locations described on the Water Tower tract above.

FISHERIES

Gourlay Creek was intensively surveyed as part of the Scappoose Bay Watershed Councils assessment conducted by David Evans and Associates. It rated very high in terms of suitable habitat for coho salmon and steelhead. It has been singled out as a key place to enhance, restore, and protect fish habitat. Fish biologists from ODF&W who have been on the site feel optimistic that historic species levels can be raised to viable levels.

The CITY has completed a large woody debris placement project to enhance fish habitat in the reach of stream just down from the dam. The City is now involved in the design and funds aquisition to construct a fish ladder to allow salmon and steelhead to migrate upstream, spawn, and hopefully repopulate these upper reaches.

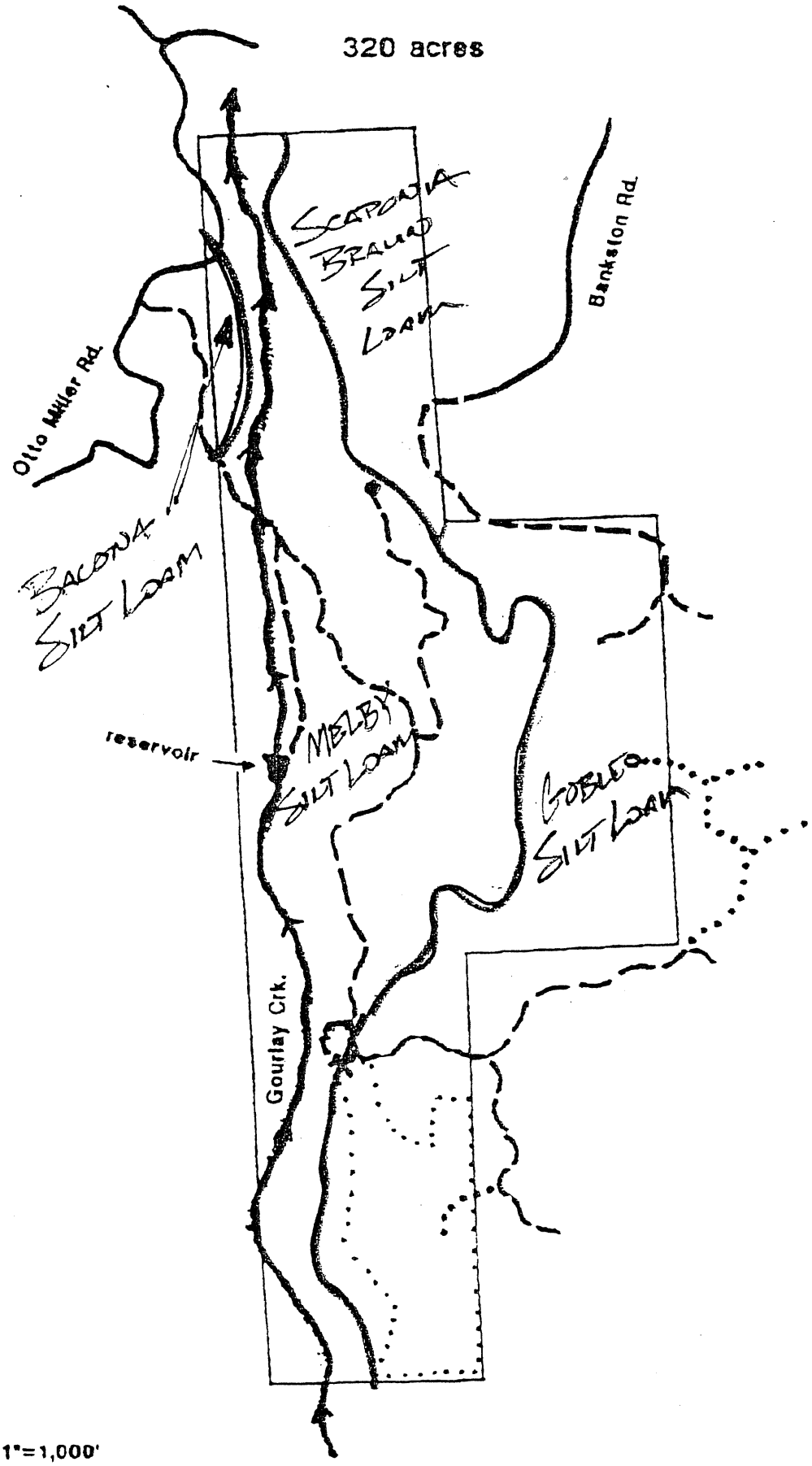
OPERATIONS PLAN

OPERATION	DATE	REVENUE	COST	HARVEST
Thinning Sale	2002	$62,000	$2,500	200 MBF
Cut Brush Type 12	2002		$1,200	
Cut Brush & Hand Chemical Type 8	2002		$4,000	
Stocking Survey	2002		$250	
Structure Based Harvest Type 10	2007	$150,000	$5,000	400 MBF
Thinning sale Types 3&6	2010	$18,000	$2,500	60 MBF
TOTALS		$230,000	$15,400	660 MBF

Following this harvest schedule for the next 10 years, with a growth rate of 4% you will end up with 2,077 MBF from a start of 2,070 MBF we have now. The CITY will make about $215,000 net in this decade, and have the same amount of merchantable timber we started with.

Gourlay Creek Tract

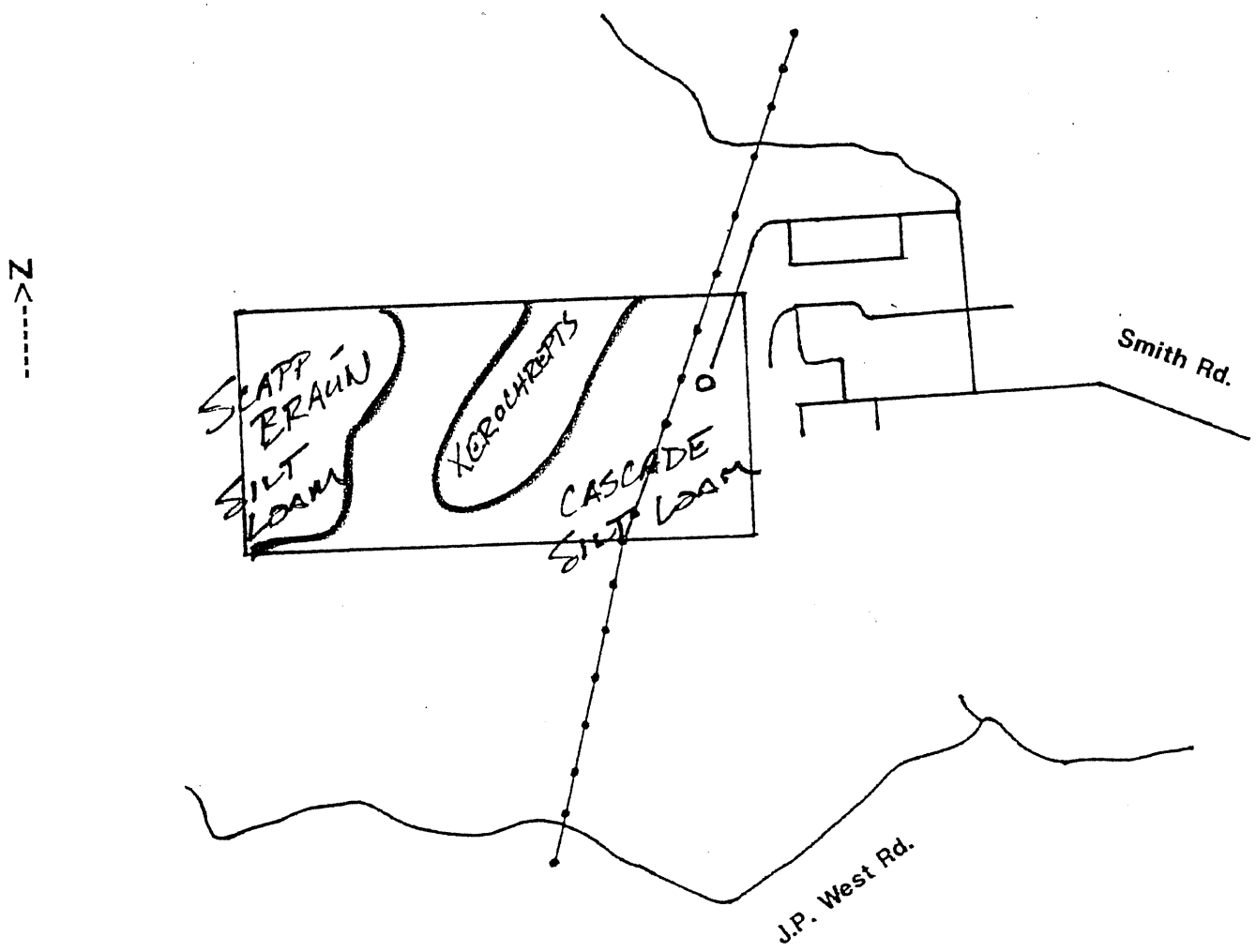
320 acres



Scale: 1"=1,000'

Water Tower Tract

80 acres



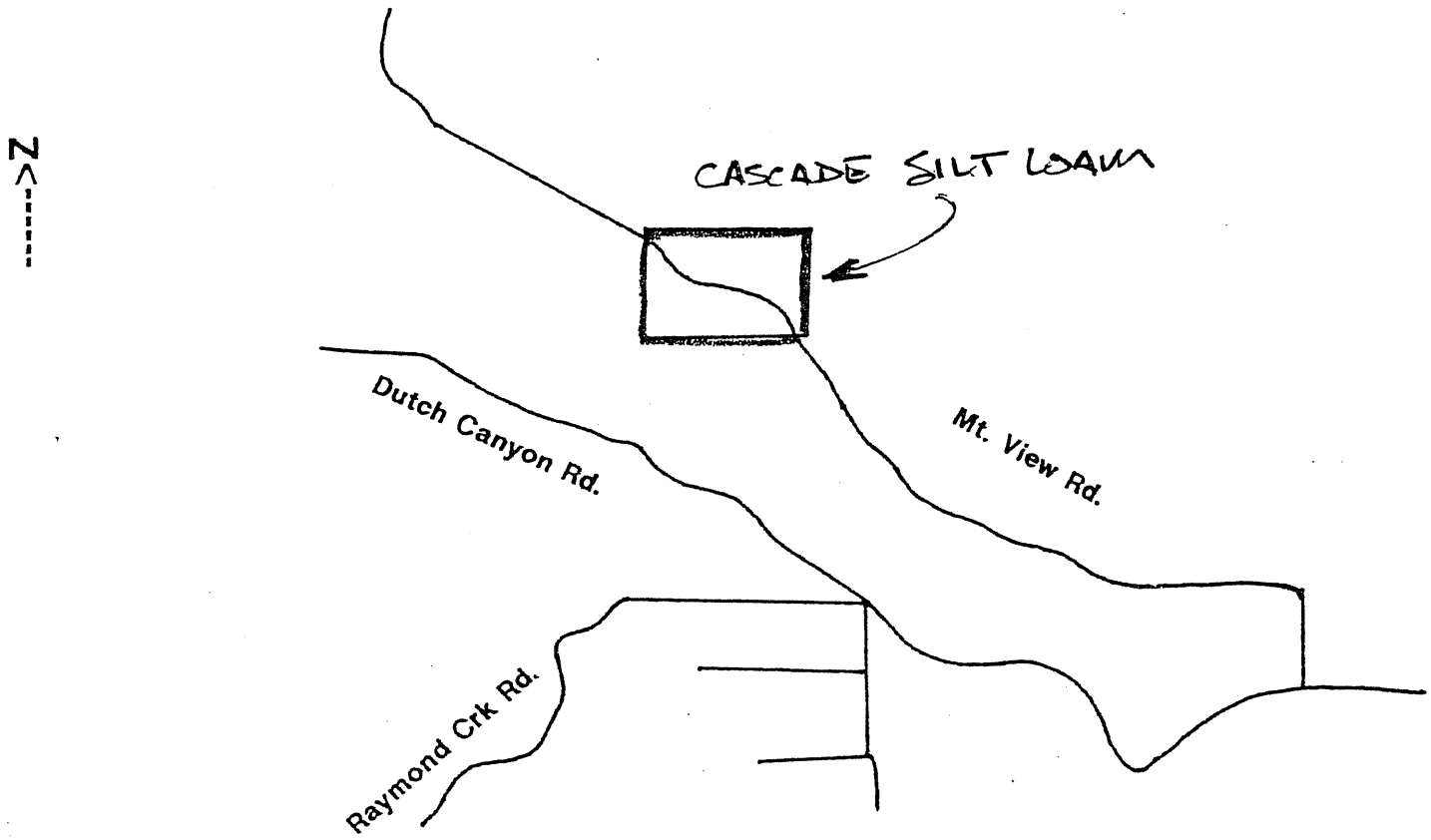
BPA powerline

water tower

Scale: 1"=1,000'

Mt. View Tract

12 acres



Scale: 1"=1,000'

Landscape Management Strategies

Under structure-based management (SBM), landscape strategies will gradually move the forest to a more desirable range of stand structures and landscape conditions, as described in this chapter and Appendix C. Once attained, this range of stand types and their relative abundance across the landscape will remain reasonably stable, although individual stands will continue to change. Because the structures will be in a dynamic balance across the landscape, the forest will provide a steady flow of timber volume and revenue, jobs, habitats, and recreational opportunities.

The approach is based on active management, with the main emphasis on the use of sound silvicultural approaches for producing timber and revenue. These silvicultural practices are designed to contribute to the range of habitat types or forest structures used by indigenous species and to enhance biodiversity. SBM will move forest management away from approaches that stress conflict and trade-offs between uses, and towards an approach that stresses integration and compatibility of uses over time and space. Instead of managing the forest to produce habitat for individual species, we will manage the forest to produce the range of habitats needed by indigenous species. This approach will reduce the likelihood of having to manage in a crisis situation for individual species or for individual sites.

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Simulation of MacMillan Bloedel/Weyerhaeuser's New Forest Management Strategy

Variable Retention

MacMillan Bloedel variable retention

Irregular shelterwood

Group selection

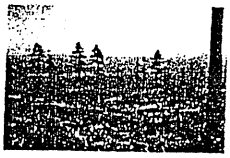
MacMillan Bloedel variable retention

Group retention

Strip shelterwood

Uniform shelterwood

MacMillan Bloedel variable retention



MacMillan Bloedel variable retention

Group retention

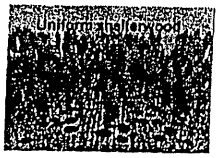
Strip shelterwood

Uniform shelterwood

MacMillan Bloedel variable retention

Group retention

Strip shelterwood



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2,4-D

Pesticide Fact Sheet: Forestry Use

Product Information

2,4-D is the common name for a phe-oxy herbicide and is the active ingredient . numerous broadleaf herbicide products sed by foresters. It is one of the most idely used herbicides in the world with pproximately 500 registered end-use oducts in the United States. Many com-ercial products are mixtures of 2,4-D id other herbicides.

Commercial forms of 2,4-D are typically er or salt (including amines) formula-ns. Salts of 2,4-D are highly water solu-e and supplied as water-based rmulations. The much less soluble esters mmonly require solvent carriers and are pplied as water emulsifiable or oil-luble formulations. Surfactants, which e like detergents, are often added to oducts so they work more efficiently.

Users apply 2,4-D at a rate of 0.5 to 3.0 unds of active ingredient per acre of rthwest forest lands. Applications are nited to one or two treatments in the life a tree stand.

For comparative purposes, the EPA (En-onmental Protection Agency) catego-es pesticides by their short-term icity. On a scale of I (most toxic) to IV ast toxic), most undiluted 2,4-D formu-ions are Toxicity Category III.

ublic Health

oxins

ioxins are a family of chemicals that lude the highly toxic TCDD. Current -D manufacturing practices have re-ed dioxin contamination to trace amounts that are below levels of concern to EPA.

Toxicity

- Researchers use animal studies to define the potential for a pesticide to cause harmful effects to human health. It is important to know that these tests are carried out using doses high enough to cause toxicity (poisoning). Effects seen at toxic doses in animals are unlikely to occur after short-term, low-level exposure in humans. The level of exposure must be considered to estimate the risk of harmful effects.

- 2,4-D is classified as slightly toxic to mammals on a short-term (acute) basis and moderately toxic on a long-term (chronic) basis.

- 2,4-D is absorbed quickly from the lungs, stomach, and intestines. It is absorbed less quickly through the skin. 2,4-D is excreted rapidly from the body with a typical half-life of 13 hours. (Half-life is the time required for half of the compound to disappear.)

- Some laboratory studies on birth defects (teratogenicity) indicate that 2,4-D may be weakly teratogenic at high doses, which were also toxic to the mother. 2,4-D did not cause birth defects when studies were conducted under current EPA guidelines.

- Data from laboratory tests and attempted suicide cases indicate that high doses of 2,4-D can impair the nervous system.

- Some older studies show that 2,4-D may cause genetic damage (be mutagenic) at high doses, but newer studies have not confirmed this earlier observation.

- The carcinogenicity (ability of a substance to cause cancer) of 2,4-D has been the focus of numerous laboratory studies. Overall results do not provide evidence that 2,4-D causes cancer. Field surveys have been inconsistent in linking occupational herbicide exposure (including 2,4-D) and cancer.

- The EPA has classified 2,4-D as a Group D carcinogen (not classifiable as to human carcinogenicity). EPA is currently reviewing available data for the reregistration of the herbicide.

Wildlife Effects

- Most 2,4-D formulations are slightly toxic to birds and practically non-toxic to bees on a short-term (acute) basis.

- 2,4-D toxicity to fish and aquatic invertebrates is highly variable and dependent on formulation type. Ester formulations are moderately to highly toxic; salt formulations are slightly toxic. 2,4-D is more toxic under conditions of lower (acidic) pH.

- 2,4-D does not bioaccumulate in wildlife.

Environmental Fate

- It is difficult to summarize the environmental behavior of 2,4-D because of the variety of formulation types.

- The half-life of 2,4-D in water ranges from 10 to 50 days. 2,4-D esters degrade more rapidly under basic conditions and may persist longer in nutrient-poor water. One study detected significant residues of

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Glyphosate

Pesticide Fact Sheet: Forestry Use

Product Information

▪ Glyphosate is the common name for the active ingredient in **Accord** and **Roundup Pro**, post-emergence herbicides commonly used in forestry vegetation management. **Roundup Pro** is designed for use strictly on plants. **Accord** can be used on plants in and around water.

▪ **Roundup Pro** and **Accord** are formulated as salts and sold in liquid form. **Roundup Pro** includes a surfactant designed to increase the uptake of glyphosate by plants; **Accord** does not contain this surfactant.

▪ Northwest users typically apply glyphosate by air or ground at 1.0 to 5.0 pounds active ingredient per acre. It is a non-selective herbicide that is applied after weeds start growing. Glyphosate used as a cut stump or injection application can contain 50 to 100% active ingredient.

▪ For comparative purposes, the Environmental Protection Agency (EPA) categorizes pesticides by their short-term toxicity on a scale of I (most toxic) to IV (least toxic). Most undiluted glyphosate formulations are Toxicity Category II.

Public Health

▪ Researchers use animal studies to define the potential for a pesticide to cause harmful effects to human health. It is important to know that these tests are carried out using doses high enough to cause toxicity (poisoning). Effects seen at toxic doses in animals are unlikely to occur after short-term, low-level exposure in humans. The level of exposure must be considered to estimate the risk of harmful effects.

▪ Based on laboratory studies, glyphosate is classified as practically non-toxic to mammals.

▪ The primary breakdown product of glyphosate is aminomethylphosphonic acid (AMPA). AMPA is also practically non-toxic to mammals.

▪ Laboratory tests on rats show that more than 90% of an administered dose is eliminated from the body within 72 hours.

▪ There is no evidence that glyphosate or AMPA cause birth defects, nerve damage, cancer, or DNA damage.

▪ The EPA has classified glyphosate as a Class E carcinogen (no evidence of carcinogenicity for humans).

Wildlife Effects

▪ Based on laboratory and field studies, **Roundup** and **Accord** are classified as practically non-toxic to birds and honeybees.

▪ While glyphosate ranges from slightly to practically non-toxic to fish, surfactants used in **Roundup Pro** may be toxic to fish and water insects. As a result, **Roundup Pro** is not approved for use in or near water. **Accord** is approved for use in and around water because it is formulated without surfactants. However, certain uses may specify the addition of surfactants.

▪ Glyphosate is not expected to bioaccumulate in wildlife.

Environmental Fate

▪ Glyphosate is stable in water and stable to breakdown by sunlight. It is degraded by aquatic microorganisms and has a half-life of 14 to 21 days in pond water. It will accumulate in sediments where it is bound.

▪ The half-life of glyphosate in soil ranges from 2 to 174 days with a typical half-life of 47 days. AMPA has a typical half-life of 118 days (71 to 165 days) in soil.

▪ Despite being highly water soluble, glyphosate and its primary metabolite, AMPA, adsorb readily to organic materials in soils. Therefore, they are unlikely to move through soils and contaminate ground or surface water.

Risk Assessment

▪ The EPA has evaluated use practices, environmental fate, potential exposure routes, and toxicity of glyphosate and has set a Reference Dose (RfD) for glyphosate of 2.0 mg/kg/day. A 70 kg (154 lb) person would have an RfD of 140 mg/day. The RfD is the amount of daily pesticide exposure judged to pose no appreciable risk over a 70-year lifetime. The RfD for glyphosate is based on the results of the most sensitive animal studies (rabbit) and includes built-in safety measures.

▪ EPA has determined that the expected exposure associated with glyphosate in forestry use will not result in adverse health effects. However, you should take reasonable precautions to avoid exposure. Do not walk through freshly-sprayed vegetation. Do not eat berries, mushrooms, or other edibles, or drink the water

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Triclopyr

Pesticide Fact Sheet: Forestry Use

roduct Information

Triclopyr is the active ingredient in veral forestry products. Product names clude **Garlon (3A and 4)** and **Path-der II.**

Triclopyr is a systemic herbicide used woody plant control and right-of-way getation management.

Triclopyr-based product formulations y be produced as either amine salts or -soluble esters. Formulation differences ve important effects on its toxicity, en-onmental activity, and mobility.

ome formulations may include an oil-ed carrier solvent.

ypical application rates range from 0.3 .0 pounds of active ingredient per e. Applications may be made by air, und foliar spray, basal spray, injection, pplications to cut surfaces.

or comparative purposes, the Environ-ital Protection Agency (EPA) catego-s pesticides by their short-term toxicity scale of I (most toxic) to IV (least c). Most undiluted triclopyr products Toxicity Category I, II, or III depend-on the formulation.

blic Health

searchers use animal studies to define otential for a pesticide to cause harm-ffects to human health. It is important ow that these tests are carried out us-loses high enough to cause toxicity oning). Effects seen at toxic doses in als are unlikely to occur after short-, low-level exposure in humans. The level of exposure must be considered to estimate the risk of harmful effects.

- Based on laboratory studies, triclopyr is classified as slightly toxic to mammals on a short term (acute) basis.

- Mammals absorb triclopyr and then rapidly eliminate it through the kidneys.

- Triclopyr does not cause birth defects or nerve damage.

- Laboratory tests with pregnant rats showed mild toxicity to the fetus only at very high doses.

- In a battery of tests, triclopyr did not cause genetic damage in all but one test.

- The EPA has classified triclopyr as a Class D carcinogen (not classifiable as a human carcinogen). Available data suggests that triclopyr does not cause cancer.

Wildlife Effects

- Based on laboratory and field studies, triclopyr is classified as slightly to practically non-toxic to birds on a short term (acute) basis. Investigations of triclopyr-treated areas show no direct toxic effects on birds.

- Triclopyr oil-soluble ester formulations are highly toxic to cold-water fish such as trout and salmon. Amine formulations are practically non-toxic to fish.

- Triclopyr is not expected to bioaccumulate in wildlife.

Environmental Fate

- In water, triclopyr is degraded in the presence of sunlight. In one field study, triclopyr applied to lakes disappeared in 4 to 8 days.

- Triclopyr has a 2- to 3-month half-life in dry tree leaves.

- Triclopyr amine salt formulations are more water soluble than the oil-soluble ester formulations and have less of a tendency to bind to organic materials in soils. As a result, amine salts are more mobile in soils than the oil-soluble ester-formulated products.

- The half-life of triclopyr in soils appears to be unrelated to formulation type. It ranges from 79 to 361 days in colder climates. A typical soil half-life under mild conditions is 30 to 46 days. The end products of triclopyr breakdown are carbon dioxide, water, and naturally occurring organic acids.

- Salt formulations of triclopyr are classified as highly mobile and can travel with water through soil and enter groundwater. It should not be applied to sensitive soils, such as sand or loamy sand, or in areas with shallow groundwater. Triclopyr can also move with runoff and enter surface water. Forestry uses should be evaluated for potential ground and surface water contamination.

- Ester formulations of triclopyr have low mobility in soil. The risk of groundwater contamination from normal triclopyr ester use is relatively low.